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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,085	06/10/2002	Steinar Bjaerum	15-DS-00564	7101

23446 7590 03/04/2004

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EXAMINER

JAIN, RUBY

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 03/04/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,085

Applicant(s)

BJAERUM ET AL.

Examiner

Ruby Jain

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-6, 11, 12, 14-16, 21, and 22 are rejected under 35

U.S.C. 102(b) as being anticipated by Iizuka et al. U.S. Patent No. 5,355,887.

Regarding claims 1, 11, 21, 22, Iizuka discloses an ultrasound machine for generating an image responsive to a moving structure of a subject comprising a front end arranged to transmit ultrasound waves into the structure and to generate received signals in response (column 3, lines 3-19), a display arranged to display the image of the moving structure, wherein the display displays at least one pattern of indicia but does comprise of a plurality of patterns of indicia that provide a real time visualization of displacement (Figure 1, Figures 3(A) – 3(E)), and (Figures 2(A) – 2(C)), a user interface enabling a user to overlay the image on the display with a first pattern of indicia (Figure 7(C)), and a processor responsive to the received signals to generate parameter signals representing displacement of the locations and generating and overlaying a second pattern of indicia corresponding to the displacement of the locations (Figures 7(A) – 7(C)) and abstract).

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Regarding claims 2 and 12, lizuka discloses wherein the moving structure is cardiac tissue (abstract).

Regarding claims 4-6 and 14-16, lizuka discloses wherein the first pattern of indicia comprises a set of lines, wherein the lines comprises dashed lines, and wherein the lines are equidistant apart (Figures 3(A)-3(E)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 7-10, 13 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over lizuka as applied to claims 1 and 11 above, and further in view of Yamazaki U.S. Patent No. 5,622,174.

2. Regarding claims 3 and 13, lizuka discloses an apparatus capable of detecting and displaying the displacement of tissue caused by heartbeat or external pressure in a real-time mode by calculating the minute displacement of tissue (abstract.)

lizuka does not disclose wherein the displacement represents deformation of the moving structure.

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Yamazaki discloses wherein movement can be decomposed into two types of movement: one is analogously-changing deformity and the other is translation and rotation of the whole cardiac muscle (column 32, lines 19-35).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to disclose wherein the displacement represents deformation of the moving structure, as per the teachings of Yamazaki into the teachings of Iizuka, because deformity is a type of displacement. Since, the apparatus in Iizuka is calculating the displacement of the tissue, it is inadvertently calculating the deformation as well.

3. Regarding claims 7, 8, 10, 17, 18, and 20, Iizuka discloses an ultrasonic echographic diagnostic apparatus capable of displaying the characteristics and properties of tissue, such as the maximum displacement of tissue and velocity of propagation of vibrations through tissue. The apparatus is capable of detecting and displaying the displacement of tissue caused by heartbeat or external pressure in a real-time mode by calculating the minute displacement of tissue (abstract.) Iizuka further discloses wherein the apparatus receives ultrasonic waves applied to, and reflected by a specimen to obtain signals representing the condition of the specimen, and produces a tomogram of a cross section of the specimen on the basis of the signals (column 1, lines 5-17).

Iizuka does not disclose wherein the processor generates parameter signals by summing a set of signal values representing mean velocities of the moving structure over a period of time, wherein the time period comprises at

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least a portion of a cardiac cycle including at least one of systole, diastole, IVC, IVR, E-wave, or A-wave, and wherein the image is one of a B-mode image or the like.

Yamazaki discloses an ultrasonic diagnosis apparatus in which a region containing an organ of an object being examined is diagnosed by means of ultrasonic beams, the organ being in motion. A mean velocity, maximum velocity are calculated and displayed (Figure 55 and column 26, line 66 – column 27, line 10). In Figure 55, one curve represents mean velocity or maximum velocity changes in systole and diastole periods over time, the other curve represents changes in integral value for either one of them. Yamazaki further discloses wherein the apparatus comprises of a system for producing B-mode images, a B-mode DSC and a B-mode frame memory (column 7, line 66 -- column 8, line 9).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to disclose wherein the processor generates parameter signals by summing a set of signal values representing mean velocities of the moving structure over a period of time, wherein the time period comprises at least a portion of a cardiac cycle including at least one of systole, diastole, IVC, IVR, E-wave, or A-wave, and wherein the image is one of a B-mode image or the like, as per the teachings of Yamazaki into the teachings of Iizuka, because the mean velocity is just a derivation of the actual velocity of propagation already calculated by Iizuka. Furthermore, Yamazaki generally discloses that the apparatus is capable of detecting and displaying the displacement of tissue caused by a heartbeat. Systole, diastole, IVC, etc. are

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just specific phases of the heartbeat and it would be obvious to focus on any phase of the heartbeat. Also, since Yamazaki already produces a tomogram of a cross section of the specimen on the basis of the signals, a B-mode image or the like, would be an equivalent for imaging purposes.

4. Regarding claims 9 and 19, Iizuka discloses wherein the portion of the cardiac cycle is selectable from a set of signal values comprising a pressure wave signal (abstract).

Response to Arguments

5. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Although, Examiner has referred applicant to specific sections of the reference in light of the rejection, Applicant is urged to read the entire reference, as the entire reference is used to reject Applicant's claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is

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filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruby Jain whose telephone number is (703) 605-4250. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dennis Ruhl can be reached on (703) 308-2262. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0858.


DENNIS W. RUHL
SUPERVISORY PATENT EXAMINER

RJ 
February 24, 2004